Wildlife Value Orientations:

Implications for Stakeholder Involvement in Wildlife Management

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Running Head: Value Orientations and Stakeholder Involvement

Abstract

As the diversity of stakeholders in wildlife issues has increased in recent decades, wildlife agencies have questioned whether their conventional methods for involving stakeholders in decision making are still adequate. To learn whether there is a basis for this concern, we examined how stakeholders' wildlife value orientations are related to their preferences for participation in wildlife management decisions. The results of a mail survey in Evergreen, Colorado revealed that traditional stakeholders (those with utilitarian orientations) prefer conventional involvement approaches that retain high influence from the wildlife agency and traditional stakeholders. In contrast, nontraditional stakeholders (those with protectionist orientations) prefer involvement approaches that share influence between wildlife agencies and stakeholders with diverse perspectives. These findings suggest that conventional forms of stakeholder involvement and related communication tools are still necessary, however alternative forms are needed to engage effectively with newer stakeholders who desire greater participation in wildlife management decisions.

Key Words: cognitive hierarchy, elk management, stakeholder involvement, value orientations.

Introduction

Expectations of citizens for greater involvement in wildlife management have increased significantly during the last two decades. At the same time, the diversity of people interested in wildlife issues has expanded from the traditional base of hunters, farmers, and ranchers to include stakeholders as varied as motorists, animal rights activists, wildlife viewers, and the tourism industry (Decker, Krueger, Baer, Knuth, & Richmond, 1996). A major need of wildlife managers today is understanding the breadth of stakeholders' values regarding wildlife and their implications for management. This research addresses that need by examining how wildlife value orientations are related to stakeholders' preferences for involvement in decision making.

The specific objectives of this study are:

1. To identify dimensions of wildlife value orientations.
2. To estimate relationships between wildlife value orientations and citizen participation preferences.
3. To gain a greater understanding of the implications of wildlife value orientations for communicating with stakeholders and engaging them in management decisions.

We begin with a description of the cognitive hierarchy, which forms the conceptual basis for the research. We then detail the survey methods used to collect data from residents of Evergreen, Colorado. Next, we describe our analysis of relationships between wildlife value orientations and preferences for stakeholder input and involvement. We conclude with a presentation of findings and their implications for wildlife management.

Conceptual Framework

Wildlife attitudes and values have been the subject of several studies within the field of human dimensions of wildlife management (Purdy & Decker, 1989). In recent years, the cognitive hierarchy, and value orientations in particular, have received increased attention in literature on natural resource management generally (e.g., Vaske, Donnelly, Williams, & Jonker, 2001) and wildlife management specifically (Fulton, Manfredo, & Lipscomb, 1996).

The hierarchical model of social cognition can be visualized as an inverted pyramid with relatively few but stable core values on the bottom and many behaviors subject to change on the top (Figure 1). Values, at the base of the inverted pyramid, develop early in life and typically remain stable throughout an individual's life (Rokeach, 1973; 1979). Moving up the inverted pyramid, basic beliefs can be organized into patterns called value orientations, which can help predict attitudes. Attitudes in turn can help predict behavioral intentions, which can help predict behavior (Ajzen & Fishbein, 1980). Empirical analysis has demonstrated that the relationships hypothesized in the cognitive hierarchy can be measured and hold true in many real-world cases (Homer & Kahle, 1988; Vaske & Donnelly, 1999).

Value orientations are of particular interest to wildlife management. Research has demonstrated that they can provide insights into acceptable management practices. For example, Zinn, Manfredo, Vaske, & Wittmann (1998) examined wildlife value orientations and grouped stakeholders into 2 categories: utilitarian and protectionist.

Their research showed that stakeholders with a protectionist value orientation were less likely to accept killing an animal than stakeholders with utilitarian value orientations, regardless of the referent wildlife species and the context. That study demonstrated that value orientations can help agencies understand stakeholders' acceptance of different management methods.

The research presented in this paper builds on that study and examines how wildlife value orientations can provide insights for understanding how to communicate effectively with different stakeholder groups and engage them in wildlife management decisions. Based on the hierarchical model of social cognition and past empirical research, we hypothesize that:

H_1: Traditional stakeholders (those with utilitarian value orientations) prefer conventional approaches to decision making where control of decision making is retained by the wildlife agency and traditional stakeholders are given opportunities to provide input.

H_2: New stakeholders (those with protectionist value orientations) prefer alternative approaches to decision making that offer greater opportunities for engagement and influence.

The null hypothesis contends that no differences exist between the stakeholder engagement preferences of traditional and new stakeholders.

Methods

Based on literature review and in particular a study by Fulton, Manfredo & Lipscomb (1996), five dimensions of wildlife attitudes were identified as being relevant to the objectives of this study:

1. Wildlife Use—Beliefs regarding the use of wildlife for human benefits.
2. Wildlife Rights—Beliefs regarding the rights of wildlife in comparison with the rights of humans.
3. Hunting/Anti-hunting—Beliefs regarding whether or not hunting is humane and a positive activity for individual hunters as well as society at large.
4. Residential Wildlife Experience—Beliefs about the importance of wildlife around the home.
5. Bequest and Existence—Beliefs about the importance of knowing that wildlife exist in the state and ensuring the continued existence of wildlife for future generations of humans.

Following previous work by Fulton et al. (1996), we designed a survey instrument that included three statements for each dimension of wildlife value orientations (Table 1). Respondents were asked to select their level of agreement with each statement rated on a five-point Likert scale ranging from "strongly disagree" to "strongly agree." Data were also collected on preferences for public participation processes and personal desires to participate in wildlife management decisions.

Data Collection

To facilitate design of a qualitative instrument, insights about the study population were initially collected through observations, document reviews, and semi-structured interviews. Insights gained from these qualitative methods were then used to develop a structured survey instrument designed to collect quantitative data. The survey instrument was reviewed by survey design experts at Cornell University, wildlife managers with the Colorado Division of Wildlife, and residents of Evergreen, Colorado.

The target population for the study consisted of residents of Evergreen, Colorado. Evergreen is a suburb west of Denver with a population of approximately 25,000 people. Because Evergreen is unincorporated, generally agreed upon boundaries do not exist. For the purpose of this study, Evergreen was defined as households within the postal codes of 80437 and 80439. A random sample of 500 households was computer generated for the initial mailing.

Dillman's (1978) and Brown, Decker, & Connelly's (1989) methods were followed for the design and implementation of a mail survey. Questionnaires with a cover letter were mailed in April 1998 followed by a reminder postcard and then an additional copy of the questionnaire accompanying a second reminder letter. Data from the mail survey were recorded in computer files using SPSS Data Entry II.

Analyses

We used confirmatory factor analysis to compose dimensions of wildlife attitudes from individual survey items. We specified estimation by the asymptotically distribution-free criterion (ADF) over the more commonly used maximum likelihood criterion (MLE) because ADF tends to be more robust than MLE with ordinal data (Bollen, 1989). As

mentioned above, the model consisted of five latent variables representing the following five dimensions of wildlife value orientations: wildlife use, wildlife rights, hunting/anti-hunting, residential wildlife experience, and bequest and existence.

Factor score weights estimated via confirmatory factor analysis were used to create observed variables representing the latent variables. Spearman's rho correlations were used to estimate the relationships between wildlife value orientations and other variables. We used Spearman's rho over the more commonly used Pearson's correlation coefficient because many of the variables are ordinal and some are dichotomous. Pearson's correlation is for use with normally-distributed, continuous data but Spearman's rho is acceptable with ordinal and dichotomous data as well (Ott 1993).

We used Amos Version 3.6 to estimate the confirmatory factor model and SPSS Version 8.0 for all other analyses.

Results and Discussion

Of the 500 questionnaires sent in the first mailing, 5 percent were undeliverable or the addressee did not live in Evergreen. After 3 waves of mailings, we received 342 useable questionnaires. The response rate, adjusted for undeliverable questionnaires, was 72 percent.

Social science survey literature reveals disagreement about acceptable response rates, but response rates above 70 percent are typically considered acceptable because at such high levels the response bias has little statistical significance (Dolsen and Machlis 1991, Goyder 1985). The impact of response bias, and thus the acceptable response rate,

may be lower when the target population is homogenous (Goudy 1976), as in the case of a small community with similar demographic characteristics such as Evergreen. Because our response rate was over 70 percent and our study site had a homogenous population, we did not conduct a follow-up study to assess the possible bias of omitting those who did not respond to the survey.

Confirmatory Factor Analysis of Value Orientations

We used confirmatory factor analysis to estimate a model of 5 wildlife value orientations: wildlife use, wildlife rights, hunting/anti-hunting, residential wildlife experience, and bequest and existence. Similar to Fulton et al. (1996), we assumed that latent variables were related, that each observed variable loaded on one latent variable, and error terms were allowed to have covariances not equal to zero. The model had a chi-square of 30.321 with 38 degrees of freedom and a probability level of 0.808. The Akaike information criterion and Bayes information criterion suggested that our model was preferred over both the saturated and independence models. Thus, measures of fit indicated that the data fit the model well, but not as well as in previous studies (e.g., Fulton et al. 1996).

One reason why our data did not fit the model as well as reported for other studies may be that our sample size was smaller. We had 349 observations as compared to 1,202 in Fulton et al.'s (1996) study. A second reason may be that we used only three items to load on each latent variable while other studies have used between three and five items for each latent variable (e.g., Fulton et al., 1996; Vaske, Donnelly, Williams, & Jonker, 2001). Considering that the model we used had been tested and replicated in previous

studies (e.g., Fulton et al., 1996; Zinn et al., 1998) and goodness of fit measures indicated that our model was well within the range of acceptability (Arbuckle, 1997; Bollen, 1989), we believe that our results are sufficiently valid to move on to the next step of our analysis and the main emphasis of our research--examining relationships between value orientations and citizen participation approaches.

Correlations between Value Orientations and Stakeholder Involvement Preferences

We used the factor score weights from the confirmatory factor model to calculate observed variables for the latent variables specified in the model. Those items with negative values for the standardized factor loadings were reverse-coded so that all factor loadings had positive values. For example, the statement "hunting helps people appreciate natural processes" was reverse-coded to be consistent with the other statements in the hunting/anti-hunting factor. Thus the hunting/anti-hunting factor more accurately reflects an anti-hunting bias.

Results showed many of the variables were significantly correlated. The variables for attitudes toward rights of wildlife (RIGHTS) and attitudes toward hunting/anti-hunting (HUNT) were highly correlated with coefficients greater than 0.9. Likewise, variables for attitudes toward wildlife in residential areas (RESIDENT) and attitudes toward bequest and existence of wildlife (EXIST) had correlation coefficients greater than 0.9. RIGHTS and HUNT were positively correlated with RESIDENT and EXIST. The variable for attitudes toward use of wildlife (USE) was negatively correlated with HUNT and RIGHTS. USE was not significantly correlated with RESIDENT and EXIST.

Due to the high correlation between HUNT and RIGHTS, we combined them in certain instances to form a dimension representative of protection sentiments toward wildlife. We also combined RESIDENT and EXIST in certain instances to form a dimension representative of appreciation for wildlife.

To better understand how wildlife value orientations are related to preferences for citizen participation, Spearman's rho correlations were estimated. We found that having an interest in learning more about elk management, providing input for decisions, and participating in decisions were significantly positively correlated with the components of appreciation for wildlife, RESIDENT and EXIST. This finding suggests that people with more positive attitudes toward living with wildlife and with stronger feelings about the importance of the existence of wildlife now and in the future are more interested in becoming involved in elk management decisions.

All value orientations with the exception of USE had significant positive correlations agreeing with the statement, "The Division of Wildlife should have more public involvement in decisions." Thus, greater protection sentiments and higher appreciation for wildlife both are associated with beliefs that there should be more public involvement in wildlife management decisions. Conversely, having lower protection sentiments and lower appreciation for wildlife suggest a belief that more public involvement is unnecessary.

Value orientations also appear to be related to preferences regarding the locus of control for decision-making. We found that greater protection sentiments had a positive significant correlation with levels of participation that call for greater control by citizens

and less control by the Division of Wildlife. Results suggest that those with high protection sentiments believe that residents of Evergreen who enjoy elk should have great influence and traditional stakeholders, such as the Division of Wildlife itself, hunters and ranchers, should have little influence on decisions. The converse is also true, suggesting that those residents who were more supportive of hunting and human use of wildlife felt that the Division of Wildlife, hunters, and ranchers should have great influence on management decisions. A lack of significant correlations suggests that appreciation for wildlife (RESIDENT and EXIST) is not related to preferences regarding locus of control.

Management Implications and Conclusions

Appreciation for wildlife (i.e., enjoying wildlife in residential areas and placing high value on the existence of wildlife now and for future generations) is associated with greater interest in learning about wildlife management and participating in management decisions. Strong protection sentiment (i.e., anti-hunting values and pro-wildlife rights values) is also associated with support for greater involvement in wildlife management. Furthermore, protection sentiments appear to be associated with preferences regarding the locus of control in decision-making, whereas appreciation for wildlife does not. Those with strong protection sentiments prefer more control by local residents who enjoy elk. In contrast, those with weaker protection sentiments prefer to yield control to the Colorado Division of Wildlife and traditional stakeholders including hunters and ranchers.

These preferences of stakeholders with diverse attitudes toward wildlife have important implications for wildlife managers designing strategies to involve the public in

decision making. Traditional forms of stakeholder involvement and related communication tools are still useful, but alternative forms are needed to engage newer stakeholders and meet their desires for greater participation in wildlife management decisions.

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Table 1

Confirmatory Factor Analysis of Wildlife Value Orientation Dimensions

Wildlife Value Orientation Dimensions	Standardized Factor Loading
Wildlife Use	
Humans should manage wild animal populations so that humans benefit.	0.445
If animal populations are not threatened, we should use wildlife to add to the quality of human life.	0.212
It is important for humans to manage the populations of wild animals.	0.858
Wildlife Rights	
The rights of wildlife are more important than human use of wildlife.	0.486
Animals should have rights similar to the rights of humans.	0.579
I object to hunting because it violates the rights of an individual animal to exist.	0.913
Bequest and Existence	
Whether or not I get out to see wildlife as much as I'd like, it's important to know that they exist in Colorado.	0.291

It's important to me to know that there are healthy populations of wildlife in Colorado.	0.797
We should be sure future generations of Colorado will have an abundance of wildlife.	0.742
Hunting/Anti-hunting	
Hunting is cruel and inhumane to the animals.	0.915
Hunting helps people appreciate natural processes.	-0.723
Hunting makes people insensitive to suffering.	0.728
Residential Wildlife Experience	
I notice the birds and wildlife around me every day.	0.411
Having wildlife around my home is important to me.	0.854
An important part of my community is the wildlife I see there from time to time.	0.944

Figure 1. A hierarchical model of social cognition provides the conceptual foundation for this study. Adapted from Fulton et al. (1996).